

Claims

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1. A medical device for assisting in the drainage of fluid from a body cavity comprising:
an elongated member comprising a distal end and a proximal end and defining a first
lumen extending therebetween; and
a valve disposed at the proximal end of the elongated member, the valve comprising:
a tube defining a second lumen in fluid connection with the first lumen, the tube
comprising a first end connected to the proximal end of the elongated member, and a socket;
a shaft at least partially disposed in the socket; and
a stopper connected to the shaft that occludes the second lumen when exposed to
retrograde pressure.
2. The device of claim 1, wherein the shaft is fixed in the socket.
3. The device of claim 2, wherein the stopper comprises a deformable film.
4. The device of claim 1, wherein the shaft is axially translatable in the socket.
5. The device of claim 4, wherein the shaft is tapered inwardly toward the stopper and the
socket is tapered inwardly toward the stopper, both preventing complete removal of the shaft
from the socket.
6. The device of claim 4, wherein the valve further comprises a spring disposed in the
socket that is biased to open the valve in the absence of a retrograde pressure.
7. The device of claim 1, wherein the tube further defines at least one additional lumen in
fluid connection with the first lumen, wherein the second lumen and the additional lumen are
disposed about the periphery of the socket.
8. The device of claim 1, wherein the stopper comprises a substantially circular surface and
the shaft is attached to the stopper at the center of the circular surface.
9. The device of claim 1, wherein the stopper further comprises a lip disposed about the
periphery of a distal surface of the stopper.
10. The device of claim 1, wherein the stopper comprises a substantially hemispherical
surface and the shaft is attached to the stopper at the center of the hemispherical surface.
11. The device of claim 1, wherein the stopper comprises a substantially wedge-shaped
section.
12. The device of claim 1, wherein the device is a stent.
13. The device of claim 1, wherein the device is a ureteral stent.

1 14. The device of claim 1, further comprising a retention structure extending distally from the
2 distal end of the elongated member.

1 15. The device of claim 14, wherein the retention structure further defines a passageway
2 extending between an opening and the first lumen.

1 16. The device of claim 1, further comprising a retention structure extending from the
2 stopper.

1 17. The device of claim 16, wherein the retention structure is a lip disposed about a periphery
2 of the stopper having a perimeter wider than the proximal end of the elongated member.

1 18. A valve for preventing reflux of fluids in a medical device comprising:
2 a tube defining a lumen having a first end and a second end, and a socket;
3 a shaft at least partially disposed in the socket; and
4 a stopper attached to the shaft that occludes the lumen when exposed to retrograde
5 pressure.

1 19. The device of claim 18, wherein the shaft is fixed in the socket.

1 20. The device of claim 19, wherein the stopper comprises a deformable film.

1 21. The device of claim 18, wherein the shaft is axially translatable in the socket.

1 22. The device of claim 21, wherein the shaft is tapered inwardly toward the stopper and the
2 socket is tapered inwardly toward the stopper, both preventing complete removal of the shaft
3 from the socket.

1 23. The device of claim 18, wherein the valve further comprises a spring disposed in the
2 socket that is biased to open the valve in the absence of retrograde pressure.

1 24. The device of claim 18, wherein the tube further defines at least one additional lumen,
2 wherein the first lumen and the additional lumen are disposed about the periphery of the socket.

1 25. The device of claim 18, wherein the stopper comprises a substantially circular surface
2 and the shaft is attached to the stopper at the center of the circular surface.

1 26. The device of claim 18, wherein the stopper further comprises a lip disposed about the
2 periphery of a distal surface of the stopper.

1 27. The device of claim 18, wherein the stopper comprises a substantially hemispherical
2 surface and the shaft is attached to the stopper at the center of the hemispherical surface.

1 28. The device of claim 18, wherein the stopper comprises a substantially wedge-shaped
2 section.

- 1 29. A method of assisting the drainage of fluid from a body cavity, the method comprising:
2 providing a medical device comprising:
3 an elongated member comprising a distal end and a proximal end and defining a
4 first lumen extending therebetween; and
5 a valve disposed at the proximal end of the elongated member, the valve
6 comprising:
7 a tube defining a second lumen in fluid connection with the first lumen,
8 the tube comprising a first end connected to the proximal end of the elongated
9 member, and a socket;
10 a shaft at least partially disposed in the socket; and
11 a stopper connected to the shaft that occludes the second lumen when
12 exposed to retrograde pressure; and
13 inserting said device into a ureter.
- 1 30. A medical device for assisting in the drainage of fluid from a body cavity, comprising:
2 an elongated member comprising a distal end and a proximal end and defining a first
3 lumen extending therebetween;
4 a seat defined by the elongated member;
5 a shoulder defined by the elongated member proximal to the seat; and
6 a ball disposed in the elongated member between the seat and the shoulder that occludes
7 the first lumen when exposed to retrograde pressure.
- 1 31. The device of claim 30, wherein the elongated member defines at least one slot between
2 the seat and the shoulder.
- 1 32. The device of claim 30, further comprising a retention structure defining a second lumen
2 in fluid connection with the first lumen.
- 1 33. The device of claim 32, wherein the shoulder is defined by an interface between the
2 elongated member and the retention structure.
- 1 34. The device of claim 32, wherein the retention structure has a pigtail shape.
- 1 35. The device of claim 30, comprising a retention structure extending from the distal end of
2 the elongated member.
- 1 36. The device of claim 35, wherein the retention structure further defines a passageway
2 extending between an opening and the first lumen.

- 1 37. The device of claim 30, wherein the device is a stent.
1 38. The device of claim 30, wherein the device is a ureteral stent.
1 39. A method of preventing reflux of fluids in a medical device, the method comprising:
2 providing a medical device comprising:
3 an elongated member comprising a distal end and a proximal end and defining a
4 first lumen extending therebetween,
5 a seat defined by the elongated member,
6 a shoulder defined by the elongated member proximal to the seat, and
7 a ball disposed in the elongated member between the seat and the shoulder that
8 occludes the first lumen when exposed to retrograde pressure; and
9 inserting said device into a ureter.